

RADIATION DOSE FRACTIONATION IN POSTMASTECTOMY BREAST RECONSTRUCTION: SYSTEMATIC REVIEW AND META-ANALYSIS WITH EMPHASIS ON COMPLICATIONS

Takuya Hayashi¹, Mami Ogita¹, Rika Kakegawa, Yuichiro Kikawa, Takeo Osaki, Kaori Tane, Saverio Caini, Chiara Doccioli, Adrian W. Chan, Henry C.Y. Wong, Jennifer Y.Y. Kwan, Caroline Hircock, Laura Snell, Joan E. Lipa, Irene Karam, Kimberly S. Corbin, Gustavo N. Marta, Edward Chow, Shing Fung Lee²

Affiliations 1. Department of Radiology, The University of Tokyo Hospital, Tokyo, Japan 2. Department of Radiation Oncology, National University Cancer Institute, Singapore, Singapore (Note: Listed for presenting and senior authors only.)

Author Contact:
takuhayashi-ky@umin.ac.jp



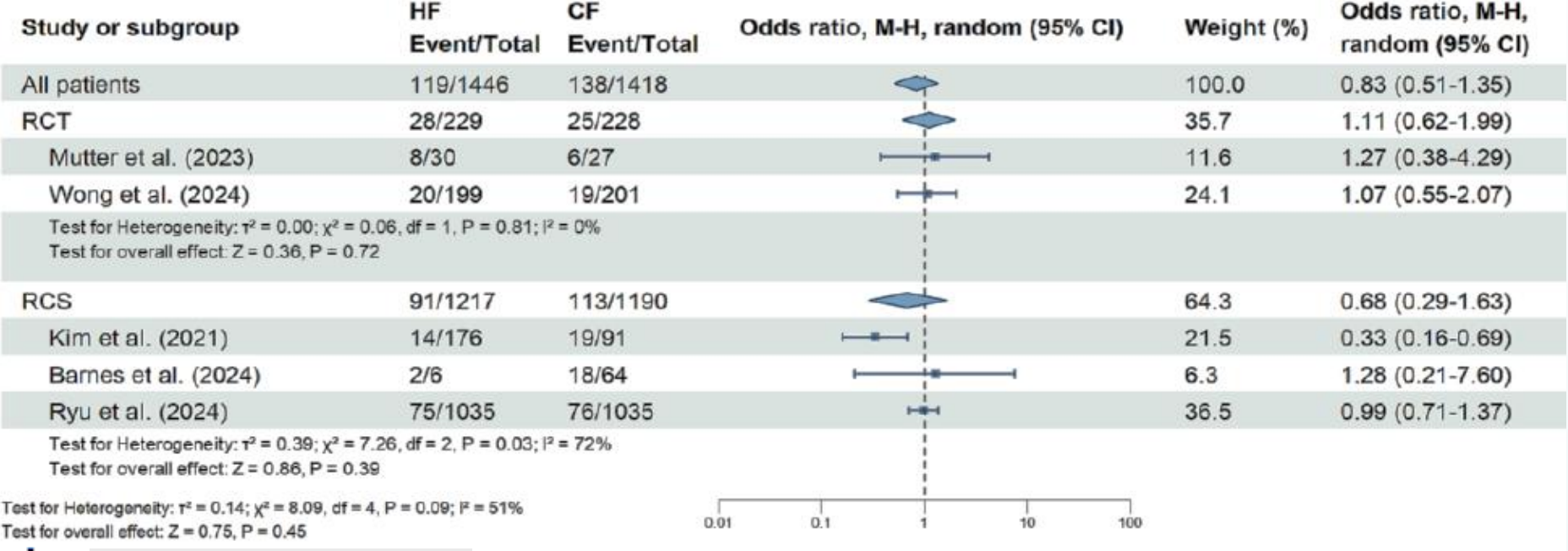
Introduction

- The safety of moderate hypofractionation (**HF**) compared to conventional fractionation (**CF**) for postmastectomy radiotherapy (**PMRT**) after immediate breast reconstruction has not been clearly established.
- This review aimed to **compare complication profiles** between HF and CF in this clinical setting.

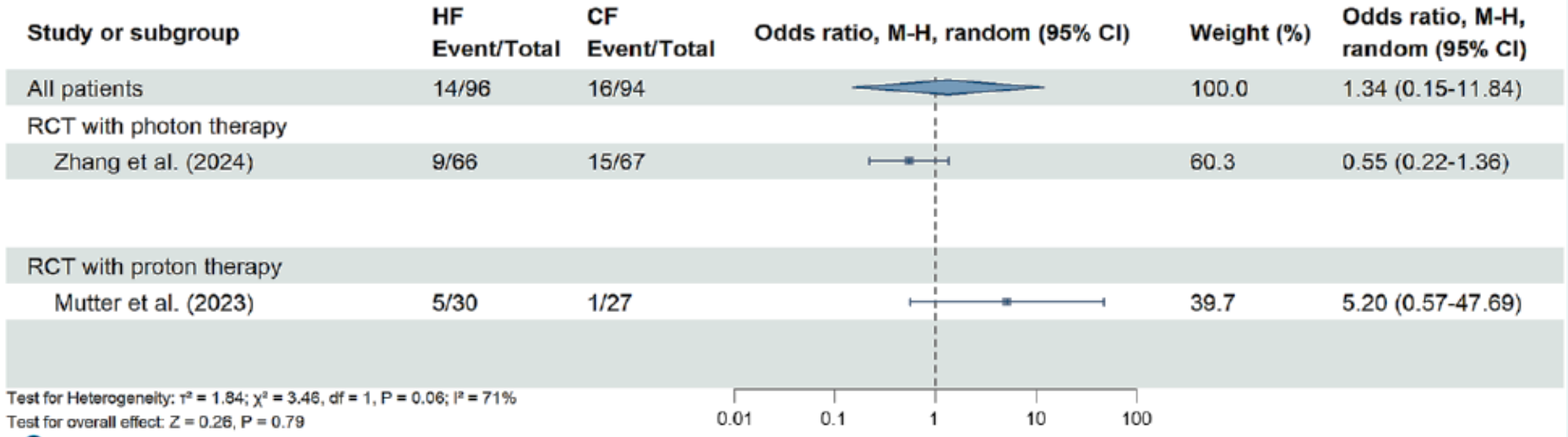
Methods

- A literature search was conducted in Embase, MEDLINE, and Cochrane CENTRAL up to January 10, 2025.
- Inclusion: Studies comparing **HF (2.4–2.7 Gy/fraction)** and **CF (1.8–2.0 Gy/fraction)** in women who underwent PMRT after immediate breast reconstruction.
- Exclusion: Studies involving intraoperative or partial breast irradiation, brachytherapy, hyperfractionation, accelerated fractionation.
- Evaluated Complications: **major complications, reconstruction failure, infection, capsular contracture, fat necrosis, wound dehiscence, reoperation, and hematoma.**
- Pooled odds ratios (ORs) with 95% confidence intervals (CIs) were estimated using a random-effects model.

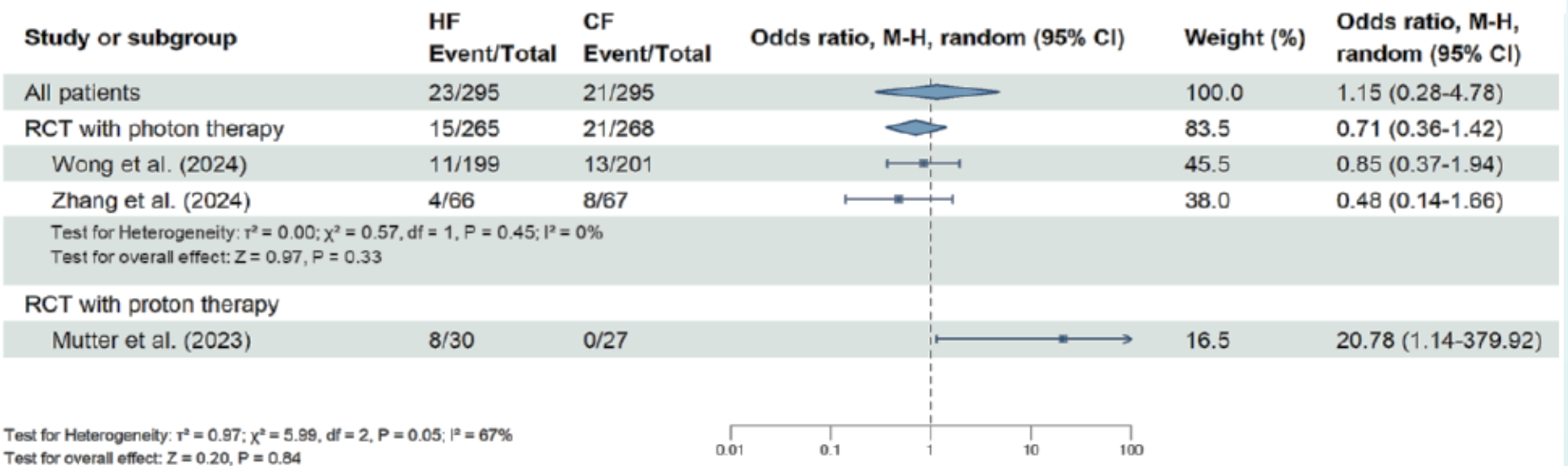
a Major complications



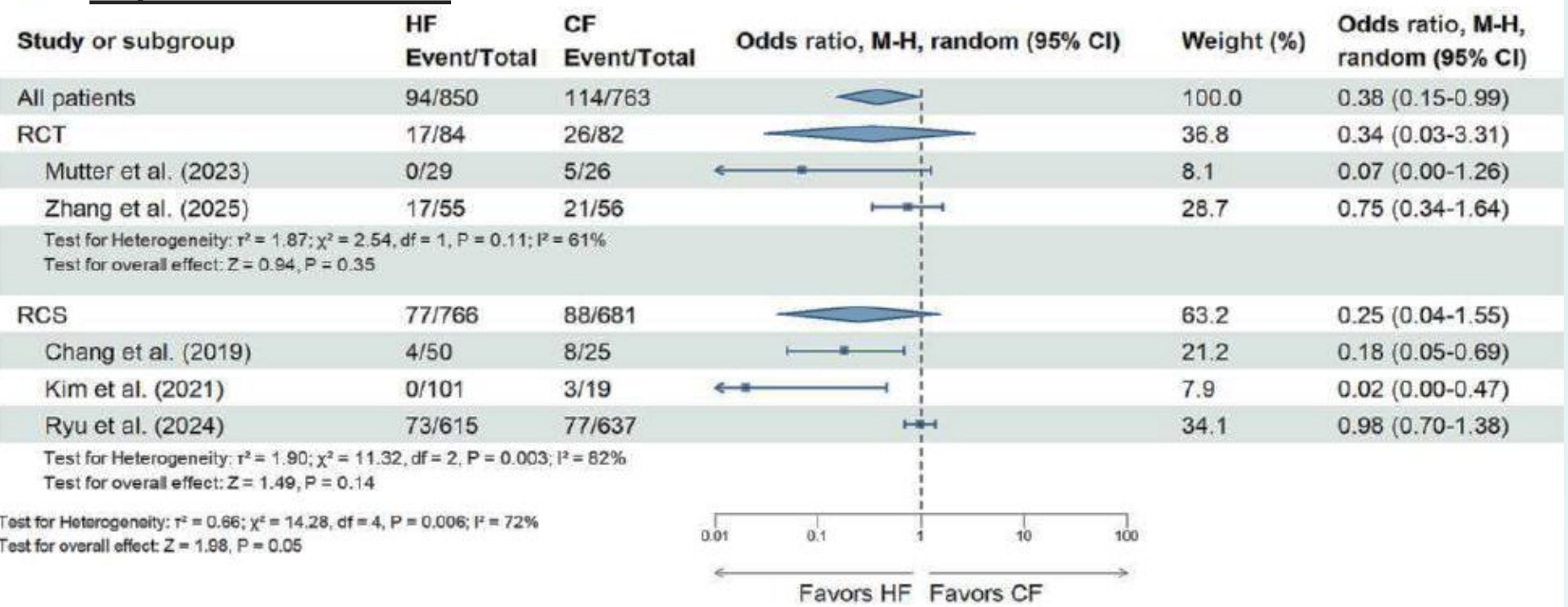
b Reconstruction failure



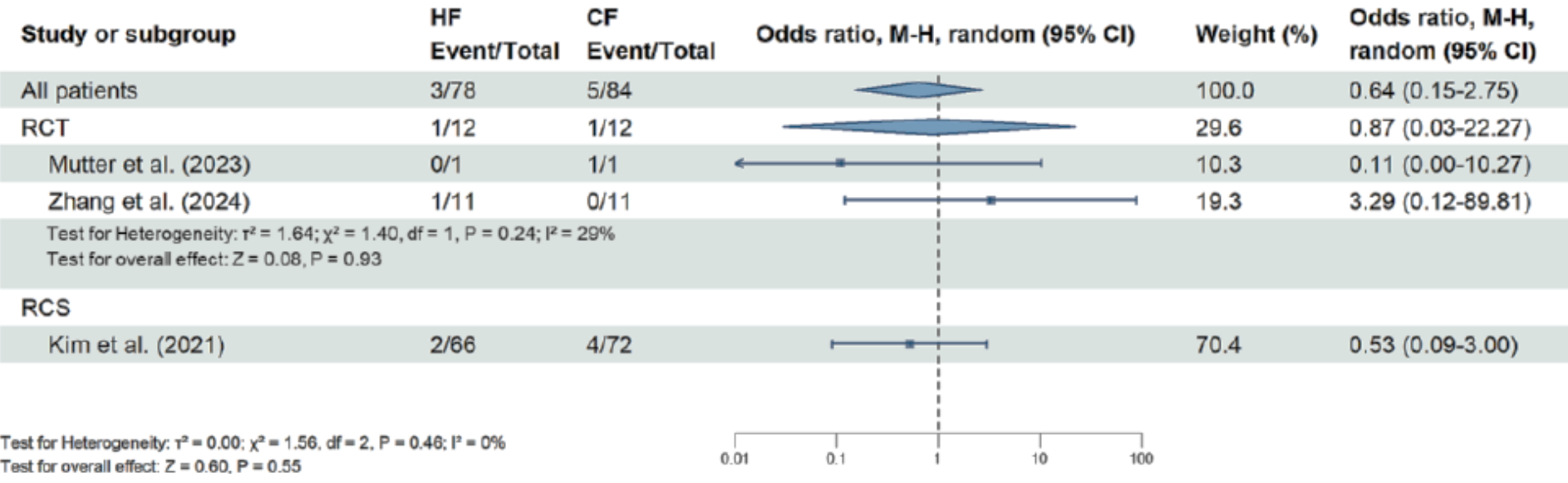
c Infection



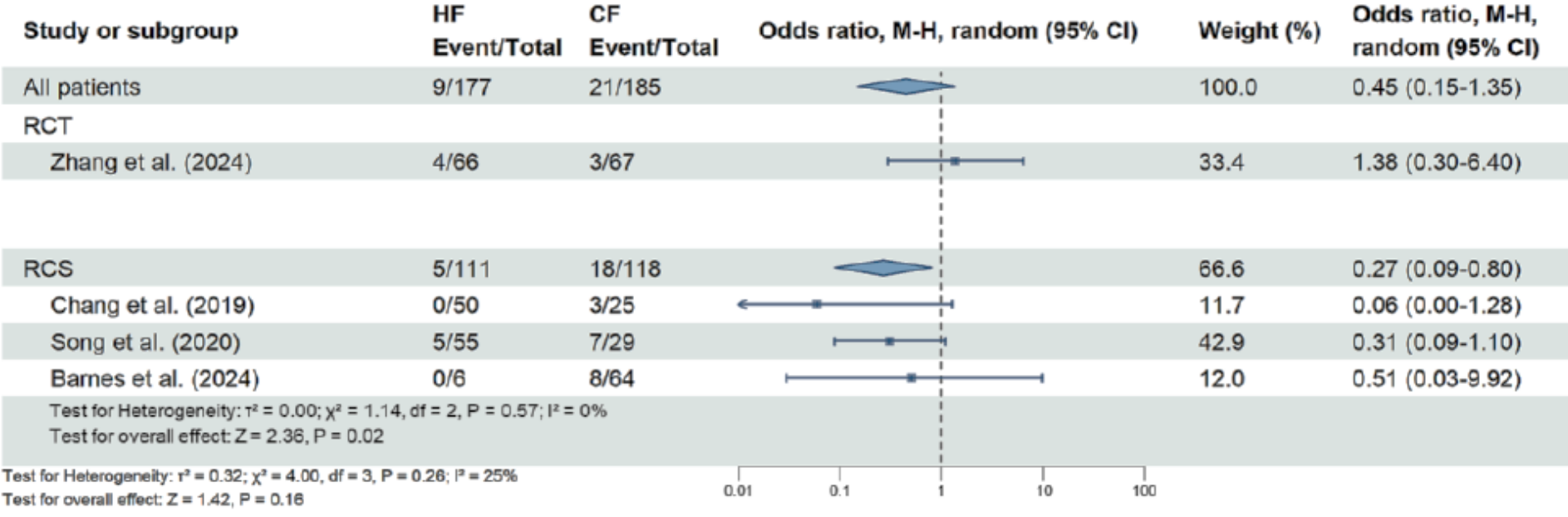
d Capsular contracture



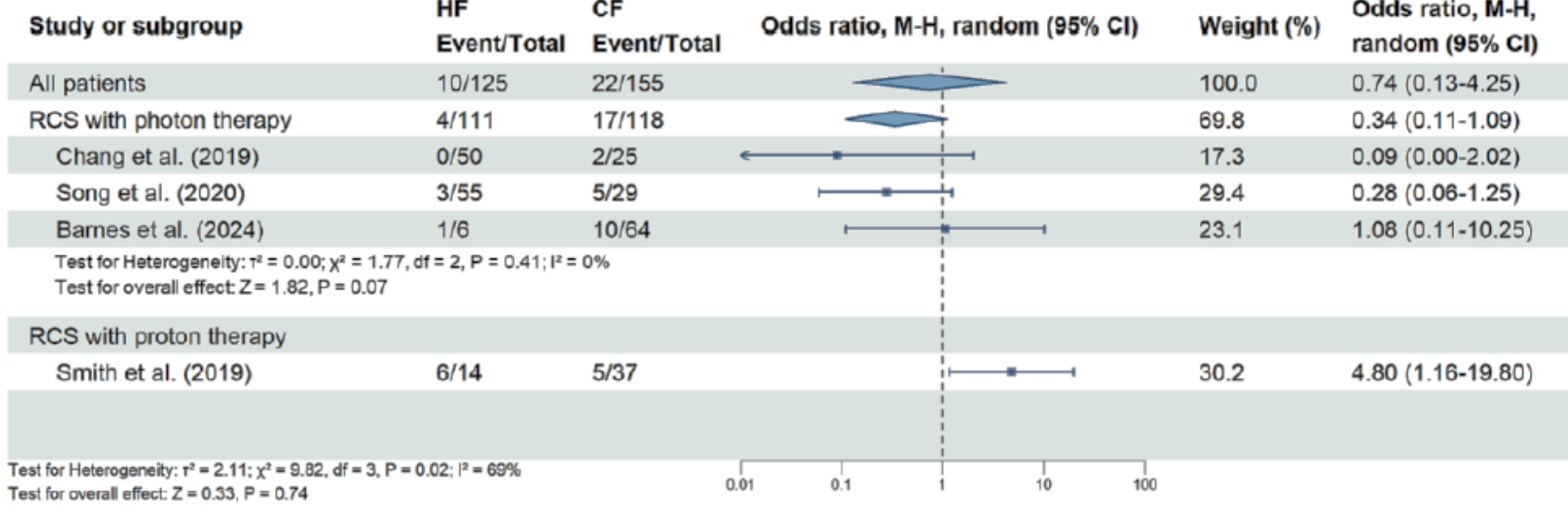
e Fat necrosis



f Wound dehiscence



g Reoperation



h Hematoma

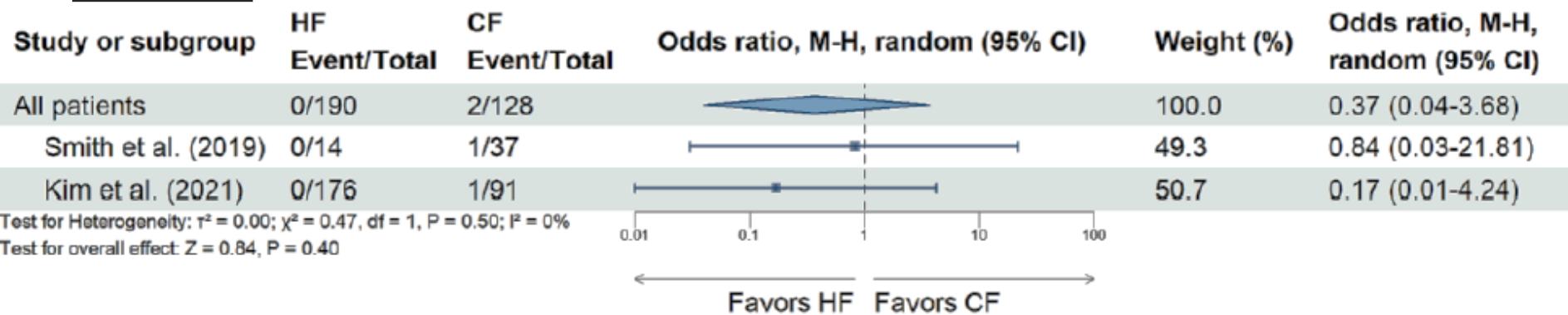


Figure 1. Forest plots of odds ratios comparing hypofractionation and conventional fractionation: (a) major complications, (b) reconstruction failure, (c) infection, (d) capsular contracture, (e) fat necrosis, (f) wound dehiscence, (g) reoperation, and (h) hematoma.

Results

- From 2,523 records, 11 studies (3,611 patients), including three RCTs, were selected.
- Eight studies exclusively used photon beams.
- Major complications were comparable between HF and CF** (OR: 0.83, 95% CI: 0.51–1.35) (Figure 1).
- HF was associated with a significantly lower incidence of capsular contracture** (OR: 0.38, 95% CI: 0.15–0.99) (Figure 1).
- No significant differences for other outcomes (Figure 1).
- Patient-reported outcomes, assessed in Wong et al. [1], showed no significant difference in the physical well-being.

Conclusion

- ✓ HF is at least comparable to CF for the assessed complications.
- ✓ HF may reduce the risk of capsular contracture, suggesting its potential advantage in minimizing complications.



Preprint available→